NATURAL RESOURCE CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

BRUSH MANAGEMENT

(Acre)
CODE 314

DEFINITION

Removal, reduction, or manipulation of non-herbaceous plants.

PURPOSES

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Restore natural plant community balance.
- Create the desired plant community.
- Reduce competition for space, moisture, and sunlight between desired and unwanted plants.
- Manage noxious woody plants.
- Restore desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality and enhance stream flow.
- Maintain or enhance wildlife habitat including that associated with threatened and endangered species.
- Improve forage accessibility, quality and quantity for livestock.
- Protect life and property from wildfire hazards.
- Improve visibility and access for handling livestock.

CONDITIONS WHERE THIS PRACTICE APPLIES

On rangeland, native or naturalized pasture, and pasture and hay lands where removal or reduction of excessive woody (non-herbaceous) plants is desired.

CRITERIA

General Criteria Applicable For All The Purposes Stated Above.

Brush Management will be designed to achieve the desired plant community in respect to woody plant density, canopy cover, or height. Succulents such as yucca and prickly pear qualify as target species for brush management.

Brush Management will be applied to achieve the desired control of the target woody species and protection of desired species. This will be accomplished by mechanical, chemical, biological, prescribed burning or a combination of these methods.

Where livestock are present, Prescribed Grazing shall be applied to ensure the desired response from treatments. Changes below.

1) **Biological – Attachment I.**

2) **Mechanical – Attachment II**

3) **Chemical Guidelines for Using Individual Plant Treatment (IPT) Control Techniques Attachment III**

4) **Chemical – Utilizing the EXSEL Program for Chemical Recommendations.** Attachment IV,

Chemical Weed and Brush Control, B-1466. – See EXSEL program http://cnrit.tamu.edu/rsg/exsel/ and/or Attachment IV, Chemical Weed and Brush Control, B-1466 http://agpublications.tamu.edu/catalog/topics/Rangelands.html. Then select the above named publication from the listing of publications.

5) Prescribed Burning – See the **Prescribed Burning standard (Code 338)**.

Where erosion and sedimentation are resource concerns because of reduced or weakened herbaceous cover as a result of excessive competition with woody species, Brush Management is an essential practice.

Brush management will not be applied to only a part of a pasture unless the entire pasture can be managed according to the needs of the treated area.

It should be understood that no single treatment of target species is adequate to solve a woody plant problem but rather a system approach should be employed which may include a combination of treatment alternatives utilized over several years.

A serious concern exists when brush densities exceed 10% crown canopy and are in excess of 50 plants per acre. Brush exceeding 10% crown canopy is medium to high priority. When less than 10% canopy exists, 50 plants per acre of mesquite, juniper, salt cedar, post oak, and associated species, baccharis and elm will be considered medium priority.

Where brush mixtures occur that include one or more species for which approved methods have been established, recommended control will be that prescribed for the species that is the greatest problem, provided one method will give adequate control of the different species, so that none of the species will continue to be a problem. If this is not possible, separate control methods may be needed.

General guidelines for control of root or crown sprouting species or those species that re-sprout from basal stems are as follows:

1) Do not apply primary brush treatment when target species are root sprouters and no follow-up treatment is planned.

2) Schedule follow-up treatment when the target plant is:

   a) MESQUITE, HUISACHE, MIXED BRUSH and their re-sprouts and/or seedlings reach an approximate 3-4 feet in height (2-3 years old following primary brush treatment).

   b) JUNIPER and its re-sprouts and/or seedlings reach an approximate height of 20 inches (3-5 years old following primary brush treatment.

   c) POST OAK , BLACKJACK OAK, Chinese Tallow, Yaupon, East Texas Hardwoods, and their re-sprouts and/or seedlings reach an approximate height of 2-4 feet (2-4 years old following primary brush treatment).

Root plowing may be planned only when soil conditions are such that a stand of grass can be readily established. All rootplowed areas must be seeded and/or planted to permanent vegetation.

Rootplowing may cause significant structural changes of plant communities. The impacts which these changes may pose on plant and animal communities should be carefully considered during the planning phase. In most instances, where woody infestations are light to moderate, other alternatives such as grubbing or individual plant treatment with herbicides should be considered.

Mechanically disturbed areas must be re-vegetated if 25% or more of the existing grass cover is destroyed by mechanical disturbance or if reseeding from existing seed sources will not provide adequate cover. Refer to the **Range Planting standard (Code 550)**

Where herbicides are used following mechanical control measures, treatment will be

delayed until adequate top growth has occurred to assure translocation of the herbicide.

Where livestock are present, **Prescribed Grazing (Code 528A)** will be applied to insure the desired response from treatments. Refer to the Prescribed Grazing standard.

Brush Management will be applied in accordance with all state and local laws and ordinances.

Additional Criteria For Improving Wildlife Habitat.

Where upland wildlife species are a primary concern, Brush Management will be planned and applied to meet the habitat requirements of the species of concern. As a general rule, leave 30 to 50% of the area in woody species to retain habitat elements necessary for desired wildlife.

Where the planned land use is for wildlife or recreation, and the operator is interested in maintaining all woody plants for aesthetic values, brush management will not be required except where necessary to control erosion. Conservationists should fully explain the benefits of selective brush control on wildlife habitat and aesthetics.

Inventories and evaluations will be made to determine the location and amount of woody vegetation to be retained for wildlife.

Brush management will be planned in a manner that will not adversely affect threatened or endangered species or their habitats.

Additional Criteria For Reducing Wildfire Hazards.

Control undesirable woody plants in a manner that creates the desired plant community yet does not provide wildfire hazard conditions.

CONSIDERATIONS

Brush Management objectives and procedures may be different on different kinds of land and for different uses of the land. For example:

1) If the primary use of grazed range is for cattle and sheep, the objective may be to manipulate distribution of brush to approximate that of natural or climax conditions for the site.

2) If the primary use is for goats or upland game, the objective may be to maintain more brush than is natural to the site and to manage the brush in a pattern on the land that favors grazing by these animals.

3) It is usually desirable to exclude all brush on pasture and hay land except for odd areas and motts left for shade or aesthetic value.

4) Brush on land where wildlife is the primary concern should be manipulated to provide optimum wildlife habitat and to facilitate wildlife management.

It is often desirable to control unwanted brush species that are less than medium priority to reduce the future need of using more costly methods.

Mechanical brush management is often applied to woody species with heavy densities and top growth. Many times it is impossible to get satisfactory control without removal of top growth as a necessary part of brush management. All operations needed for brush management, with or without seeding, will be included as necessary elements. This may include any combination of the following as needed: chain, doze, rake, stack, burn, rootplow, power grub, axing, etc. (See Attachment II).

Each conservationist must analyze the brush stand with the land user and consider the total impact of brush management on the environment. Once all alternatives and values have been analyzed, a plan can be formulated and decisions can be made.

Primary brush treatments are applied over a long-term planning horizon of 10-20 years. Initial treatments must be followed by maintenance-type treatments planned to prevent costly primary treatments from recurring, to protect the resources, and to

extend the effective life of the primary treatment.

Mechanical, chemical, biological, and prescribed burning methods may be used singly or in combination, depending on such factors as:

1) Kind of land and/or site

2) Topography

3) Species of woody plants (whether they are root or crown sprouters or non-sprouters)

4) Size, abundance, and distribution of woody plants

5) Hazards of treatment (if any)

6) Objectives of the land user

7) Costs in relation to expected benefits

8) Extent of existing erosion or erosion potential

Applications of certain herbicides may negatively impact desirable forbs and woody species that are essential to wildlife habitat. Special precautions must be taken to preserve habitat when herbicides are used.

Woody plants that may provide essential wildlife habitat may be removed when utilizing certain mechanical control treatments. Special precautions must be taken to preserve habitat when these methods are used.

Timing and sequence of brush management in a pasture and/or the entire operating unit should be planned to complement grazing management needs.

Consider soil erosion potential and difficulty of vegetation establishment when choosing a method of control that causes soil disturbance.

If any threatened or endangered species of plants, animals, or birds, etc. are known to occur in an area where brush management is planned, the conservationist will inform the client and suggest appropriate measures to protect these species consistent with other compelling needs. Protective measures include the following:

1) Not doing any brush management in these areas.

2) Doing brush management on a selective basis to create conditions that favor the threatened or endangered species.

3) Fencing sensitive areas (where biological control is used) to protect them from livestock grazing.

Protecting Present, Secondary, and Future land use values – The client will determine the number and species of trees or shrubs to be left for aesthetics, shade, recreational use, and wildlife habitat. Densities of remaining trees and shrubs shall be planned so that they will not interfere with the growth of protective cover for the soil.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for each pasture, field, or management unit where Brush Management will be applied based on goals and objectives of the and owner.

Plans and specifications will be based on the practice standard and may include narratives, maps, drawings, job sheets, or similar documents. These documents will contain the following data as a minimum:

Brush canopy and/or species count, transect line locations and percent canopy and/or species numbers per acre of the target plant(s).

As needed, maps or drawings showing areas to be treated and areas to be left undisturbed should be prepared.

For mechanical treatment methods, plans and specifications will include types of equipment and any modifications necessary to enable the equipment to adequately complete the job. Also included should be:

- Dates of treatment
- Operating instructions

- Techniques or procedures to be followed

For chemical treatment methods, plans and specifications will include:

- Herbicide name and label instructions.
- Rate of application or spray volumes and herbicide concentrations
- Acceptable dates of application
- Any special application techniques, timing considerations, or other factors that must be considered to ensure the safest, most effective application of the herbicide

For biological treatments, plans and specifications will include:

- Kind of biological agent or grazing animal to be used
- Timing, duration, and intensity of grazing or browsing
- Desired degree of grazing or browsing use for effective control of target species
- Maximum allowable degree of use on desirable non-target species
- Special precautions or requirements when using insects or plants as control agents

OPERATION AND MAINTENANCE

Operation: Brush Management practices shall be applied using approved materials and procedures. Operations will comply with all local, state, and federal laws and ordinances.

Success of the practice shall be determined by evaluating re-growth or recurrence of target species after sufficient time has passed to monitor the situation and gather reliable data. Evaluation periods will depend on the methods and materials used.

Safety: Certain aspects of Brush Management constitute potential agricultural pollutants to water and air. To avoid possible contamination and degradation of the resources, and to protect people, livestock, wildlife, and desirable plants against contamination, the following points will be considered by conservationists planning brush control:

1) Conservationists will caution persons using herbicides that if they are improperly handled or applied or if unused portions or containers are improperly disposed of, they may be injurious to humans, domestic animals, desirable plants, fish, and other wildlife and may contaminate water supplies. Users of herbicides will be cautioned to follow the directions and heed all precautions on the container label, to respect all USDA pesticide registrations and policies, and to abide by state and county regulations.

2) To reduce the possibility of pollution and to increase the effectiveness of the herbicide, chemical control methods should not be used during periods of unstable weather where there is a possibility of rain within 5 hours after application of the chemical.

3) Mechanical brush control operations should be timed so as to limit exposure of bare soil for undue periods of time.

4) When prescribed burning is used as a brush management practice, the regulations and policies of the Texas Natural Resources Conservation Commission on Environmental Quality should be adhered to.

Maintenance: Following initial application, some re-growth, re-sprouting, or recurrence of brush should be expected. Spot treatment of individual plants or areas needing retreatment should be done as needed.

ATTACHMENT I

Biological Brush Control: Use goats for follow-up treatment after chaining, dozing, chopping, prescribed burning, shredding, or for initially controlling oak. The use of goats is never the primary brush treatment unless the brush is already accessible for control by goats. Use brush heavily in spring after leaves are fully developed to assure complete defoliation by June 1. Control only the amount of area at one time that goats can be concentrated on for sufficient defoliation. Pastures that are being goated for brush management will not be grazed with other kinds of livestock.

The following methods will be used to control brush with goats:

1) Priority Pastures

   Choose two pastures to rotate goats between and assign one first priority and the other second priority. Sufficient goats are needed to maintain 85 percent defoliation in the first priority pasture and 65 percent defoliation in the second priority pasture if brush is mechanically controlled in that pasture.

   Control the brush mechanically in the first priority pasture.

   Initiate goating when leaves are fully developed in late April or early May. Place the goats in the first priority pasture at the rate needed and as often as necessary to maintain at least 85 percent defoliation. When the goats are not in the first priority pasture, they will be placed in the pasture with second priority. Maintain this rotation for the full growing season. It is desirable to defer the pasture during winter and spring while brush is dormant.

   During the second year, reverse priority on the pastures and proceed with the rotation.

   In the beginning, it is recommended that at least a prior fall deferment be made with no winter grazing on the pasture to be mechanically treated and goated the following growing season.

2) Thirty (30) Days In and 30 Days Out

   The most effective control occurs when new leaves and twigs are browsed in the initial stage of growth immediately following full leaf expansion. Stock with sufficient goats to obtain at least 65 percent defoliation in approximately 30 days. After defoliation, rest the pasture for approximately 30 days. The system is a 30-day in and 30-day out grazing system with goats - resulting in at least 3 months of rest each growing season. A minimum of 3 years of goating is generally needed to obtain desired control. It is desirable to defer the pasture during winter and spring while brush is dormant.

3) Fifteen (15) Days In and 15 Days Out

   Apply the system in the same manner as the 30-day in and 30-day out except that a 15-day in and 15-day out rotation is utilized.

ATTACHMENT II, Mechanical Brush Control. Eligible brush species, approved control methods, time of treatment, technical application follows:

SPECIES	METHOD	TIME	TECHNIQUES OF OPERATION
Agarito, Catclaw, Blackbrush, Bumelia, Elbowbush, Lotebush, Yaupon, and other low brush species. Mixture of many species of South Texas and Southwest Texas (CHAPARRAL)	Rootplow	Anytime 1/	Stack and burn top growth as needed. Root plow to an eight to ten inch depth. Rootplow blades must be equipped with kickers (fins) to bring roots to the surface and expose crowns and/or bud zones for greatest effect. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project into and through the soil. Follow up by repeat dozing, hand grubbing, or herbicide as necessary to control sprouts.
	Power grubbing (tree dozing), hand grubbing	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
Agarito, Blackbrush, Bumelia, Catclaw, Cenizo, Elbowbush, Guajillo, Lotebush, Yaupon, Texas persimmon, and other low brush species. Mixture of many species of South Texas and Southwest Texas (CHAPARRAL)	Heavy off-set plow rhome disc, and crawler tractor, & Roller chop	Anytime 1/	Two trips over the acreage are generally required for these practices to be most effective. The second application should be plowed diagonal to the first plowing. The rhone disc must be at least 30 inches in diameter and the weight of the plow must be at least 1500 lbs. per linear foot. Plow to sufficient depth to cut brush below the bud zone. These practices are intended to be used on listed species and other Rio Grande Plains low brush species and are not intended to be used on species such as Mesquite and Huisache. These practices primarily apply to shallow and gravelly sites but can include sites such as gray sandy loam and sandy loam depending on brush species present. These practices do not apply to rocky soils. These practices are most effective when used as a component practice for a system of brush control that is planned. Satisfactory control will not occur if planned as an independent one-time practice. Stack or burn top growth as needed.

Baccharis A common invader into old fields, pastures of Central South, and East Texas	Rootplow	Anytime 1/	Stack and/or burn top growth as needed. Rootplow to a sufficient depth to undercut plants with a rootplow equipped with fins that bring roots to the surface. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project through the soil.
	Hand grub - power grubbing (tree dozing)	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
HARDWOODS Blackjack oak, post oak, winged elm, yaupon, eastern persimmon, locust, plus eastern red cedar	Rootplow,	Anytime 1/	Stack and/or burn top growth as needed. Rootplow to a sufficient depth to undercut plants with a rootplow equipped with fins that bring roots to the surface. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project through the soil. Follow-up to control sprouts. Plow 12" to 14" and 18" on deep sands.
	Hand grubbing, power grubbing (tree dozing)	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Applicable when stems are 3" or more in diameter at breast height (dbh). Apply only when soil has good moisture to a depth of at least 12". Stack and/or burn top growth as needed. Grub to at least a 14" depth. Control sprouts as needed with goats, acceptable chemicals, prescribed fire, or mechanical methods.
	Chain,	Anytime 1/	Chains must weigh 50 lbs. per link or more. Chain two ways. Soil moisture should be sufficient to allow uprooting of target species. Be aware that chaining will spread prickly pear. Follow-up to control sprouts is a necessary part of the treatment.
	Axe, Girdle	Anytime May to September	Girdle trees 6 to 8" in diameter by removing a 3" width of cambium layer. Cut down smaller trees and chemically treat stumps to prevent sprouting.
Creosote, Tarbush Desert shrub common to Trans-Pecos and Southwest Texas	Dragging, railing, standard chaining (tarbush dominant areas only)	Anytime	This practice is only partially effective in controlling these species. It is most successful if used following rain when soil is moist and plants are fully leafed out. Chaining only effective when tarbush plants have their crown exposed to permit pullout of roots. Use naval anchor chain that has a minimum size-of-the-link diameter of 2-1/4 inches.

Creosote, (cont.)	Ely and disc chaining	Anytime	Not applicable on fine-textured soils. Should not be used when mesquite is a predominant species. Must be followed by range seeding. Chains are pulled in a "J" pattern. Two-way chaining in opposite directions is a minimum requirement with Ely chain.
	Rootplow or disc	Anytime 1/	Limited to soils, slopes, and extra water areas as specified for range planting. Blade must run approximately 6-8 inches beneath the soil surface. Cutter blade should have 3-4 or preferably 5-6 kickers or fins projecting upward and backward at approximately 22-degree angles from the cutter blade. Chain will be attached to each side of plow and dragged behind rootplow to flip brush out of ground. Discing should be to a depth that will pull out tarbush and creosote plants. Range seeding will follow rootplowing or discing. Disc must be set to plow out and dislodge the entire crown of all plants in the stand.
	Mowing (tarbush only)	When plants are in full foliage and prior to seeding or maturity	In and out grazing with sheep and goats can be done to remove regrowth and aid in reduction of tarbush, in a system similar to that for shin oak.
Huisache & Retama Invaders in grasslands of South Texas the Gulf Region and Central Texas. Is continually moving north.	Rootplow	Anytime 1/	This practice is most effective when performed during the summer months. When rootplowing is done during periods outside the summer months, a rake or drag should be used to pull the plants out. Stack and/or burn top growth as needed. Plow to at least a 14" depth. Rootplow blade must be equipped with kickers or fins to bring roots to surface. Fins should be attached at 22 - degree angle, not over 30" apart and long enough to project into and move through the soil. Stands with predominantly seedling huisache or retama, may be plowed to an 8 to 10" deep.
	Power grub (tree doze)	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Applicable when stems are 3" or more in diameter at breast height (dbh). Apply only when soil has good moisture to a depth of at least 12". Stack and/or burn top

			growth as needed. Grub to at least a 14" depth. Trees must be uprooted below the bud zone. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and may destroy the seed source of desirable grass species.
Juniper – Ashe (blueberry), Eastern Red cedar.	Chain one way	Anytime	Applicable where juniper is the dominant species. The ground must be moist to give effective control. Reapply chaining in opposite direction 30 months or later as needed. Use heavy naval anchor chain with a minimum weight of 50 pounds per link. Sprouts or seedlings must be controlled by goats, chemicals, or fire.
Ashe is common on limestone soils of Central Texas	Chaining two ways (opposite direction)	Anytime	Applicable where juniper is so thick that two-way chaining is needed to obtain adequate initial control (dense stands).
	Power grubbing (tree dozing)	Anytime 1/	Trees must be uprooted below the bud zone. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and will destroy the seed source of desirable grass species.
Eastern Redcedar occurs on sandy soils of central and East Texas	Axe, saw, and power equipment such as hydro-axe or shears	Anytime	Removal of all green growth and aboveground foliage are essential for control. Very effective techniques to be used on these non re-sprouting species.
	Cable	Anytime	Use 2 strands of cable. One strand should be about 1/3 longer than the other should. Applicable to stands where 75% of the cedar exceeds 4' height and less than 15% crown canopy exists.
	Rootplow	Anytime 1/	Stack and/or burn top growth as needed. Plow to at least an 8 to 10" deep. Rootplow blades must be equipped with fins attached at 22 – degree angle, not over 30" apart to bring roots to the surface. Uproot trees below bud zone.

Juniper (Redberry) Common to rocky soils of Western Texas	Power grubbing (tree dozing)	Anytime 1/	Trees must be uprooted below the bud zone. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and will destroy the seed source of desirable grass species.
	Chaining	Anytime	Chaining is applicable with good soil moisture. Sprouts must be controlled by goats, chemicals, or fire.
Macartney Rose Invader in Gulf Coast and Southeast Texas	Railing	Anytime	Railing is most applicable on rosehedge that is too large to get an effective herbicidal treatment due to poor coverage. Railing is used to manipulate plants to get them in a condition to get an effective control with recommended herbicidal rates. This practice should not be used as a stand-alone practice. This practice should be followed up using prescribed burning and/or recommended herbicide control.
Mesquite Common to most of Texas	Rootplow	Anytime, 1/	Stack and/or burn top growth as needed. Plow to at least a 14" depth. Rootplow blades must be equipped with fins to bring roots to the surface. Fins should be attached at a 22-degree angle, not over 30" apart, and be long enough to project into and move through the soil. If the stand is dominantly seedling mesquite, plow 8" to 10" deep. All treatments must uproot trees below the bud zone.
	Power grubbing (tree dozing), hand grubbing	Anytime, 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and/or burn top growth as needed. Grub to at least a 14" depth. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and may destroy the seed source of desirable grass species. Sprouts should be controlled utilizing chemical or mechanical individual plant treatments (IPT).
Mesquite Common to most of Texas	Chain	Anytime, soil moisture is adequate	Applicable to tree-type (single stem) mesquite with at least 75% of trunks 8" or more diameter. Apply only when soil has good moisture to a depth of at least 12". Chain two ways. Use naval anchor chain within minimum weight of 50 lbs. per link. Chaining is only applicable where the brush is such that it requires additional treatment prior to rootplowing to remove heavy brush. This practice is not to be used as a stand-alone practice. This practice may spread prickly pear.
Persimmon,	Hand grub, power grubbing,	Anytime 1/	Individual plant treatment must be carried out and a thorough job of uprooting the plant must be done to

Texas Central, South and Southwest Texas, often in rocky soils.	(tree dozing)		avoid resprouting. Sprouts must be controlled mechanically or with chemicals.
Pricklypear, tasajillo	Grubbing, piling pricklypear	Anytime	Must remove entire crown. Do not leave pads or joints scattered on ground. Stack and burn.
Saltcedar Common invader on all watercourses, wet areas in West and Central Texas	Rootplow,	June 1/ July August	Plow at least 12” deep. Rootplow must be equipped with kickers or fins spaced 30" apart; 30" long, and connected at the blade at a 22 - degree angle. Rootrake as needed to remove all roots.
	power grub (tree doze)	Anytime, 1/	Trees must be uprooted below the bud zone. This is best accomplished with a “stinger”. Flat blades are not acceptable. Corners of blades are not as desirable as “stingers” and will destroy the seed source of desirable grass species.
Shin oak Occurs on sands of West & NW Texas plus rocky soils of the Hill Country, Edwards Plateau, and Grand Prairie	Deep plowing or rootplowing	Winter or summer 1/	Not applicable on dune or blowout areas. Plow 20 to 30” deep on sandy soils where there is no sandy clay loam, clay loam, or gravelly base. Plow 10 to 20” deep on sandy soils with sandy clay loam base, but do not exceed a plow slice of 1/3 of the clay loam or sandy clay loam materials. Follow-up to control resprouts. Rootplow at least 18” deep. Blades must be equipped with fins or kickers not over 30” apart and long enough to extend through the soil.
Whitebrush (Beebrush) Common on valley, and deep soils of South Texas and South-central Texas	Offset disk plow	Anytime 1/	Disk twice. The disk must be 30” in diameter. The weight of the offset plow must be at least 750 lbs. to 1000 lbs. per foot of cut. The area should be plowed at sufficient depth to cut the whitebrush below the bud zone. The second discing shall be done 2-4 months after the initial operation and at right angles to the first discing. This practice should not be used on rocky or gravelly soils.

Rootplowing,	Anytime 1/	Stack or burn top growth as needed. Plow to sufficient depth to cut the dominant brush plants below the crown or bud zone. The plow should be equipped with fins spaced not over 30" apart, which will bring the plant roots to the surface. Sprouts must be controlled mechanically or with chemicals.
power grubbing (tree doze), hand grubbing,	Anytime	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
Chaining, shred, roller chop	Anytime	Adapted only for knocking down plants so that goats can reach leaves, or as a temporary control requiring repeated treatment. Effective as a component practice to a brush management system.

1/ Seeding or sprigging will be done during the current or next applicable date. Ground disturbance is best in fall or early winter if seeding is planned for next spring.

ATTACHMENT III – Chemical Guidelines for Using Individual Plant Treatment (IPT) Control Techniques.

1) Refer to EXSEL program or B-1466, Chemical Weed and Brush Control, for selected species and recommended herbicides, rates, and time of year to treat.

2) Individual Plant Treatment (IPT) has proven to be cost effective and much more effective than most broadcast treatments.

3) Conservationists must consider the type of targeted species when selecting herbicidal IPT. IPT basal treatments are most feasible on plants with 1-2 basal stems. IPT foliar treatments are most feasible on multiple stemmed plants less than 8 feet tall.

4) Plant densities in terms of plants/acre rather than crown canopy should be used when determining whether or not to use IPT. As a general rule of thumb, densities of greater than 400 plants per acre should be controlled by means other than IPT. Plant size also influences the feasibility and cost of IPT.

5) The preferred method to determine density of targeted species is the belt-transect method. A simple method for conducting a belt transect is to use a 10-foot long piece of PVC pipe. Walk along a pre-determined path for 436 feet counting all target species that root under the width of the pipe, and multiply the number of species counted by ten which will provide the plant density in plants per acre. An alternative method is to use one-hundredth of an acre (21' x 21') or one-tenth of an acre (66' x 66') plots to determine density by counting the number of target plants rooted inside the plots and multiplying by the appropriate value. Several plots or belt transects will usually be needed in each pasture to determine average density.

6) Research has shown that substantially less herbicide may be needed per acre when using IPT as opposed to standard broadcast methods. This makes IPT an environmentally sound choice as well as a more economically sound one.

7) Broadcast treatments have proven effective on some species such as mesquite. Many other undesirable woody species do not respond to broadcast treatment. Some of the more difficult problem species respond well to low volume basal treatments using 25% triclopyr and 75% diesel fuel. Some of these species and the approximate percent control include:

Agarito	91%
Catclaw acacia	80%
Catclaw mimosa	83%
Javelina bush	100%
Lotebush	90%
Prickly ash	100%
Salt cedar	82%
Wolfberry	100%
Yaupon	100%
Yucca	93%

8. IPT has broadened the application window considerably. Low volume basal treatments can be applied anytime during the year. Foliar sprays often can be applied for several months during the year and foliar sprays often can be applied during most of the growing season. Recommended rates and timing should be carefully followed. Follow all label directions.

ATTACHMENT IV, Chemical – Utilizing the EXSEL Program for Chemical Recommendations. Chemical Weed and Brush Control, Publication B-1466. This product is available in both hard copy and electronic copy. Please refer to the electronic copy for the most up to date product. The electronic EXSEL Chemical publication B-1466 can be found on the following web site designation:http://cnrit.tamu.edu/rsg/exsel/

APPROVAL AND CERTIFICATION

BRUSH MANAGEMENT

(ACRE)

CODE 314

PRACTICE STANDARD

PRACTICE STANDARD APPROVED

___/s Homer Sanchez_____ _____October 29, 2002___

State Range Management Specialist Date

This practice standard is needed in _____Field Office.

_____ _____

Natural Resource Manager Date

CERTIFICATION:

Reviewed and determined adequate without need of revision.

_____ _____

Zone Range Management Specialist Date

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Zone Range Management Specialist Date

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Zone Range Management Specialist Date

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Zone Range Management Specialist Date

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Zone Range Management Specialist Date

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service.

References and Other Reading Material

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